Deep Learning

« The man when the computer dreams »

Introduction

- Google research blog
  - Publication of June 17th, 2015
  - Going deeper into neural networks

Plan

- Some definitions
- Actual use
- Artistic part

Définition 1/2

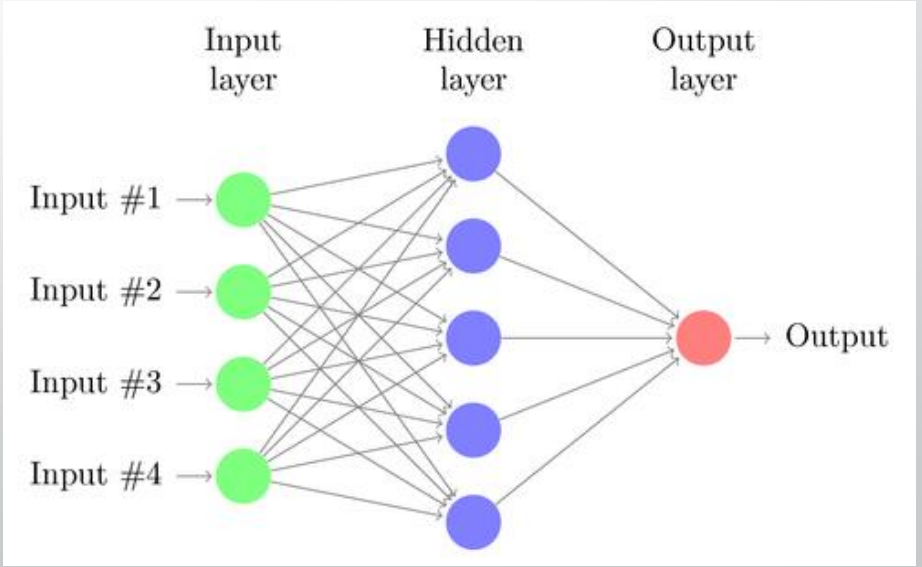
- Machine Learning :
  - Take a lot of Data
  - Take Big algorithm
  - Group twice
- Two parts :
  - Teach Parts (show the way to the algorithm)
  - Automated Parts

A special way to solve problem without understanding them

Definition 2/2

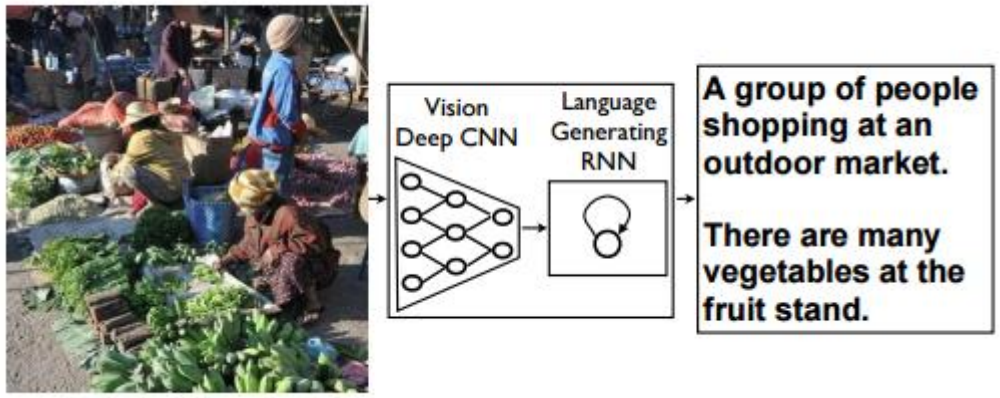
- Deep Learning
  - A class of Machine Learning (Supervised algorithm)
  - Supervised = system will learn to classify
  - Composed of neural network
    - 1 = good result
    - 0 = bad result
    -]0;1[= not enough precise

Example of neural network



Actual Use 1/3

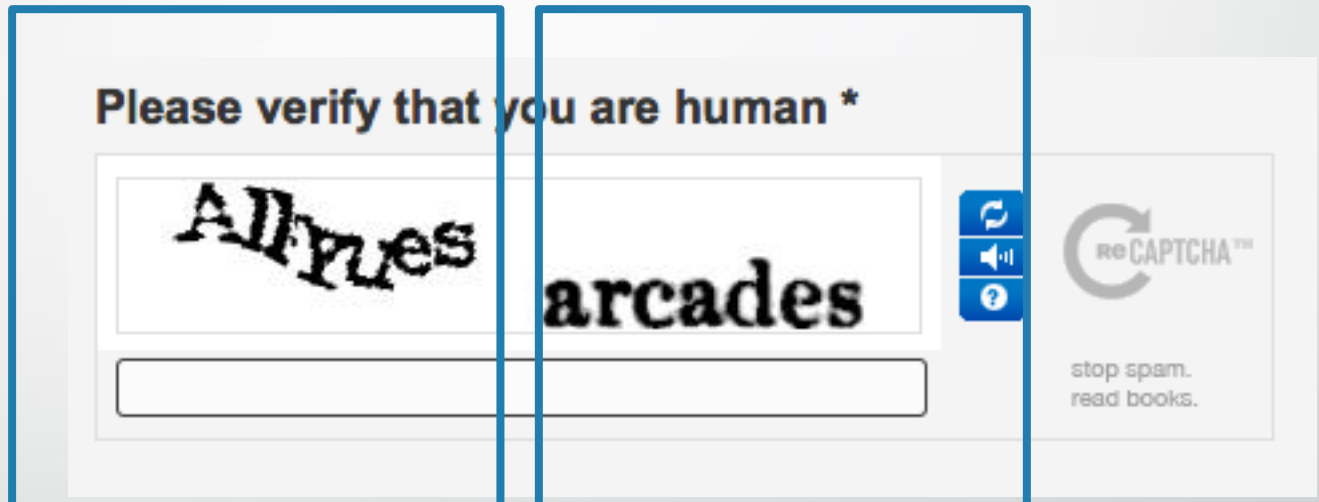
- With deep learning you can :
  - Discribe picture
  - Classify people
  - … etc



Actual Use 2/3

Actual Use 3/3

- Captcha



Teached Part

Automated Part

Artistic Part 1/2

Starry Night, Vincent Van Gogh

Artistic Part 2/2

+

- A large Database of Images
- A sorting algorithm

Conclusion

- Artificial Intelligence = danger for humanity ?

Sources/Bibliography

- http://googleresearch.blogspot.fr/2015/06/inceptionism-going-deeper-into-neural.html
- http://www.texample.net/tikz/examples/neural-network/
- http://thecreatorsproject.vice.com/blog/what-do-computers-dream-of-when-they-look-at-art
- http://arxiv.org/pdf/1411.4555v1.pdf

Questions ?

To go further

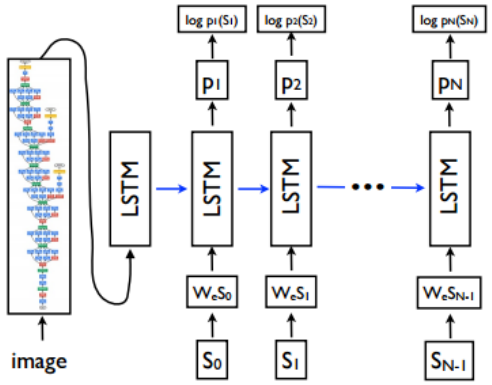


Figure 3. LSTM model combined with a CNN image embedder (as defined in [30]) and word embeddings. The unrolled connections between the LSTM memories are in blue and they correspond to the recurrent connections in Figure 2. All LSTMs share the same parameters.

Long short Term Memory

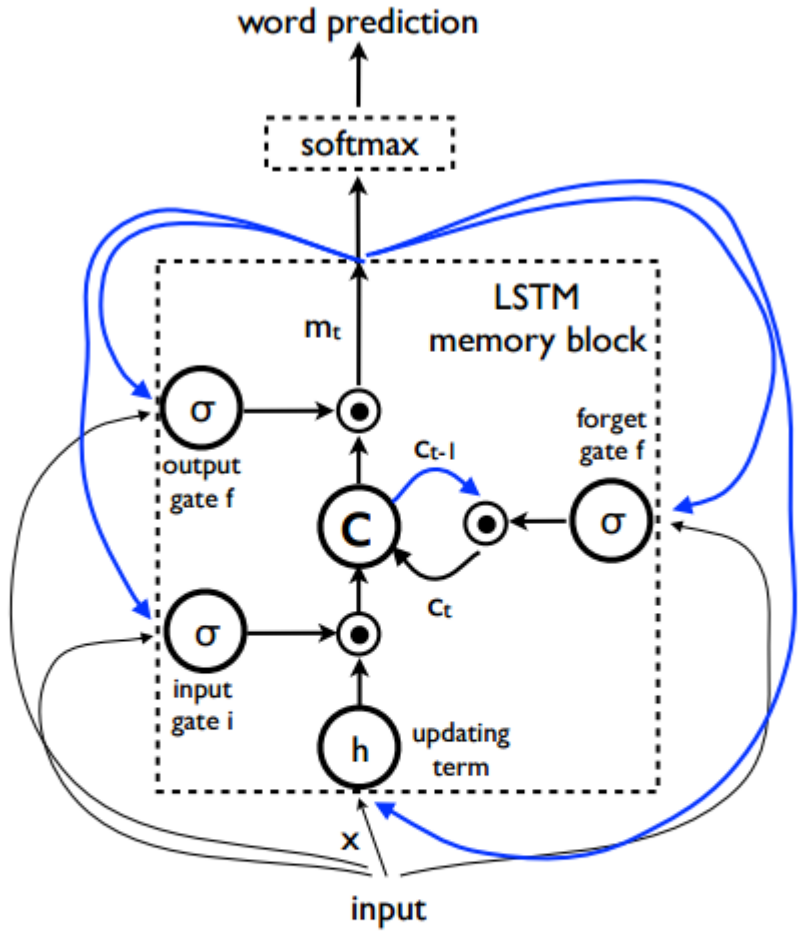
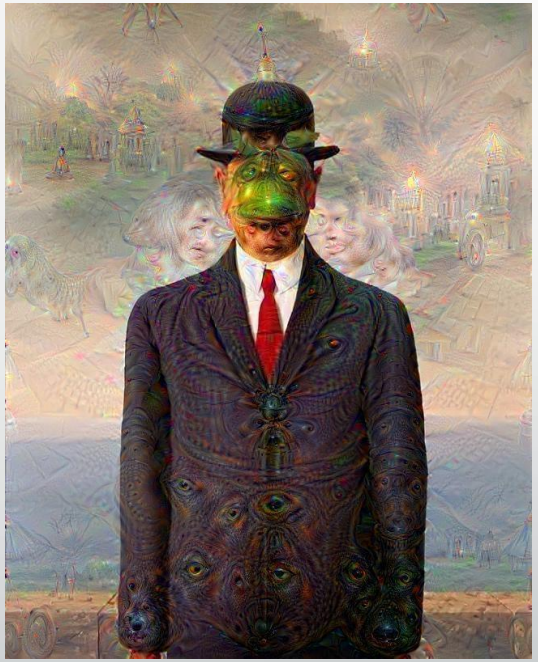


Figure 2. LSTM: the memory block contains a cell c which is controlled by three gates. In blue we show the recurrent connections – the output m at time $t-1$ is fed back to the memory at time t via the three gates; the cell value is fed back via the forget gate; the predicted word at time $t-1$ is fed back in addition to the memory output m at time t into the Softmax for word prediction.

Few more pictures

The Persistence of Memory, Salvador Dalivia

Few more pictures



The Son of Man, René Magritte

Few more pictures

The Last Supper, Leonardo DaVinci

Few more pictures

The Birth of Venus, Sandro Botticelli

Find more

- https://www.deepdreamit.com